Suisun Marsh Monitoring Program
Channel Water Salinity Report

Reporting Period: March 2013

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1. SUISUN MARSH MONITORING STATIONS AND REPORTING REQUIREMENT

As per the State Water Resources Control Board (SWRCB) Water Rights Decision 1641, dated December 29, 1999, and previous SWRCB decisions, the California Department of Water Resources (DWR) is required to provide monthly channel water salinity compliance reports for the Suisun Marsh to the SWRCB. Conditions of channel water salinity in the Suisun Marsh are determined by monitoring specific electrical conductivity, which is referred as "specific conductance" (SC). The locations of all listed stations are shown in Figure 5.

The monthly reports are submitted for October through May each year in accordance with SWRCB requirements. The reports are required to include salinity data from the stations listed below to ensure salinity standards are met to protect habitat for waterfowl in managed wetlands:

COMPLIANCE STATIONS:		
Station Identification	Station Name	General Location
C-2*	Collinsville	Western Delta
S-64	National Steel	Eastern Suisun Marsh
S-49	Beldon's Landing	North-Central Suisun Marsh
S-42	Volanti	North-Western Suisun Marsh
S-21	Sunrise	North-Western Suisun Marsh

Data from the stations listed below are included in the monthly reports to provide information on salinity conditions in the western Suisun Marsh:

MONITORING STATIONS:		
Station Identification	Station Name	General Location
S-97	Ibis	Western Suisun Marsh
S-35	Morrow Island	South-Western Suisun Marsh

* Throughout the report, the representative data from nearby USBR station is used in lieu of data from station C-2.

Information on Delta outflow, area rainfall, and operation of the Suisun Marsh Salinity Control Gates are also included in the monthly reports to provide information on conditions that may affect channel water salinity in the Marsh.

2. MONITORING RESULTS

2.1 Channel Water Salinity Compliance

During the month of March, salinity conditions at all five compliance stations were in compliance with channel water salinity standards (Table 1). Compliance with standards for the month was determined for each compliance station by comparing the progressive daily mean (PDM) of high tide SC with respective standards. The standard for March was 8.0 mS/cm. The progressive daily mean is the monthly average of both daily high tide SC values. The mathematical equation is shown below:

$$PDM = \frac{\sum \text{daily average of high tide SC}}{\text{\# days in the month}}$$

2.2 Delta Outflow

Outflow for March 2013 ranged between 6,680 cfs and 13,420 cfs (Figure 3). For the month, outflow began at 9,470 cfs and dropped to 8,000 cfs before responding to a storm event on March 6th. Outflow was maintained at 12,000 cfs then declined to 6,680 cfs and ended the month at 7,630 cfs. In addition to the storm event on March 6th, there were two lesser events on March 21st and March 31st. The monthly Delta outflow is represented by the mean Net Delta Outflow Index (NDOI). The NDOI is the estimated daily average of Delta outflow. Mean NDOI for March 2013 is listed below:

Month	Mean NDOI (cubic feet per second)
March	9,650

2.3 Precipitation

Precipitation for the month totaled 1.07 inches. Three events occurred during the month. The first occurred on March 6th (0.90 inch), followed by a small event on March 21st (0.03 inch), and finally an event on March 31st (0.14 inch). This data was recorded at the Fairfield Water Treatment Plant. The monthly total precipitation is below:

Month	Total Precipitation (inches)
March	1.07

2.4 Suisun Marsh Salinity Control Gates Operations

Operations and flashboard/boat lock installations at the Suisun Marsh Salinity Control Gates (SMSCG) during March 2013 are summarized below:

Date	Gate Status	Flashboards Status	Boat Lock Status
March 1-31	3 Open	In	Partially Closed

Given the dry conditions in March, salinity will continue to be monitored and if levels should increase, operation of the radial gates may be needed.

Boat lock gates are partially closed due to ongoing investigation on safety concerns expressed by Delta Field Division staff. NOAA was briefed about the safety concern and will schedule a field visit to assess options with DWR to balance fish needs and safety needs.

3. DISCUSSION

3.1 Factors Affecting Channel Water Salinity in the Suisun Marsh

Factors that affect channel water salinity levels in the Suisun Marsh include:

- Delta outflow;
- tidal exchange;
- rainfall and local creek inflow;
- managed wetland operations; and,
- operations of the SMSCG and flashboard configurations.

3.2 Observations and Trends

3.2.1 Conditions During the Reporting Period

For March 2013, PDM salinity levels at compliance stations Collinsville (C-2), National Steel (S-64), Beldon's Landing (S-49), Sunrise Club (S-21) and Volanti (S-42) ended the month between 1.43 mS/cm and 6.34 mS/cm as shown in Figure 1. Salinity levels for March started in the range of 0.39 mS/cm to 4.87 mS/cm. Stations C-2 and S-64 stayed mostly constant through the month while stations S-49, S-21, and S-42 had a gradual upward trend.

Salinity levels at monitoring stations Morrow Island (S-35) and Ibis (S-97) are shown in Figure 2. Both stations had a gradual increase in salinity during the month ending the month at 7.85 mS/cm for S-35 and 7.59 mS/cm for S-97.

3.2.2 Comparison of Reporting Period Conditions with Previous Years

Monthly mean high tide SC at the compliance and monitoring stations for March 2013 were compared with means for those months during the previous nine years (Figure 4).

March's mean salinity pattern for all compliance and monitoring stations ranked the highest in salinity levels for the past 10 years. This is due to an abnormally dry March. The pattern followed that of 2012 but at a slightly higher salinity level. As expected, the salinity levels gradually increased from east to west.

Table 1: Monthly Mean High Tide Specific Conductance at Suisun Marsh Water Quality Compliance Stations March 2013

Station Identification	Specific Conductance (mS/cm)*	Normal Standard	Normal Standard Met?
C-2**	1.43	8.0	Yes
S-64	3.32	8.0	Yes
S-49	5.84	8.0	Yes
S-42	6.34	8.0	Yes
S-21	6.23	8.0	Yes

*milliSiemens per centimeter

**The representative data from nearby USBR station is used in lieu of data from station C-2.

Figure 1: Suisun Marsh Progressive Daily Mean High Tide Specific Conductance for Compliance Stations March 2013

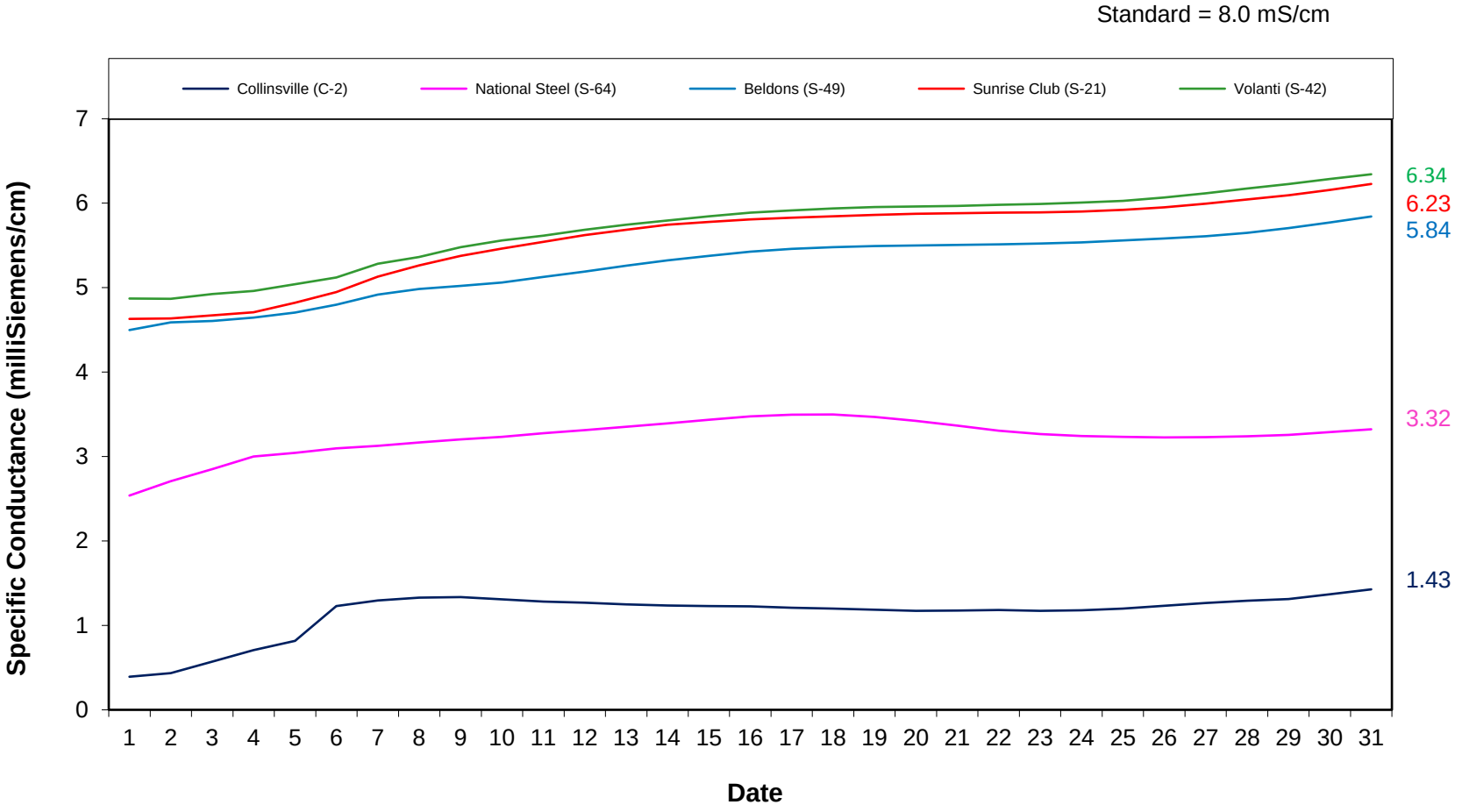


Figure 2: Suisun Marsh Progressive Daily Mean High Tide Specific Conductance for Monitoring Stations March 2013

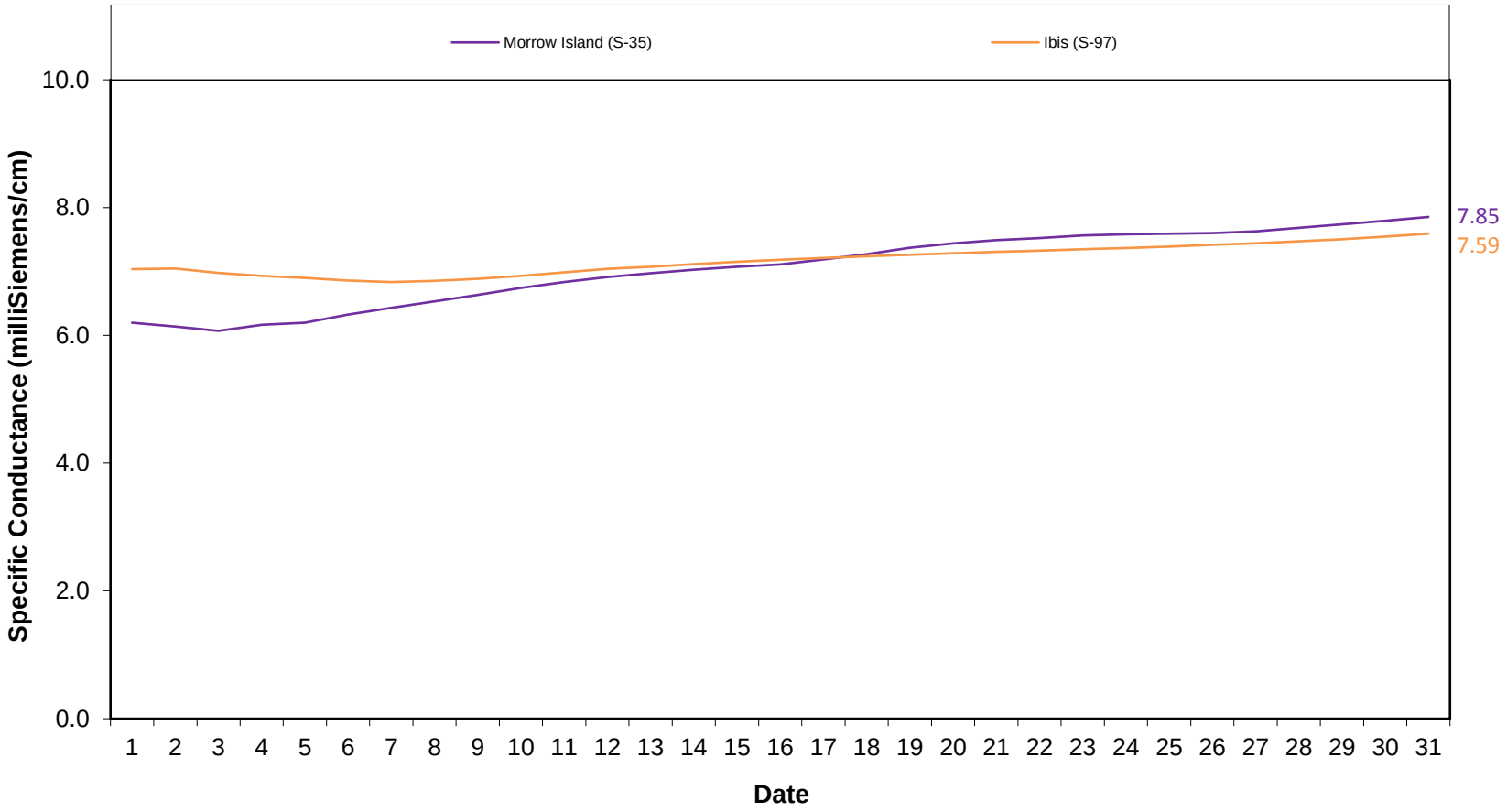
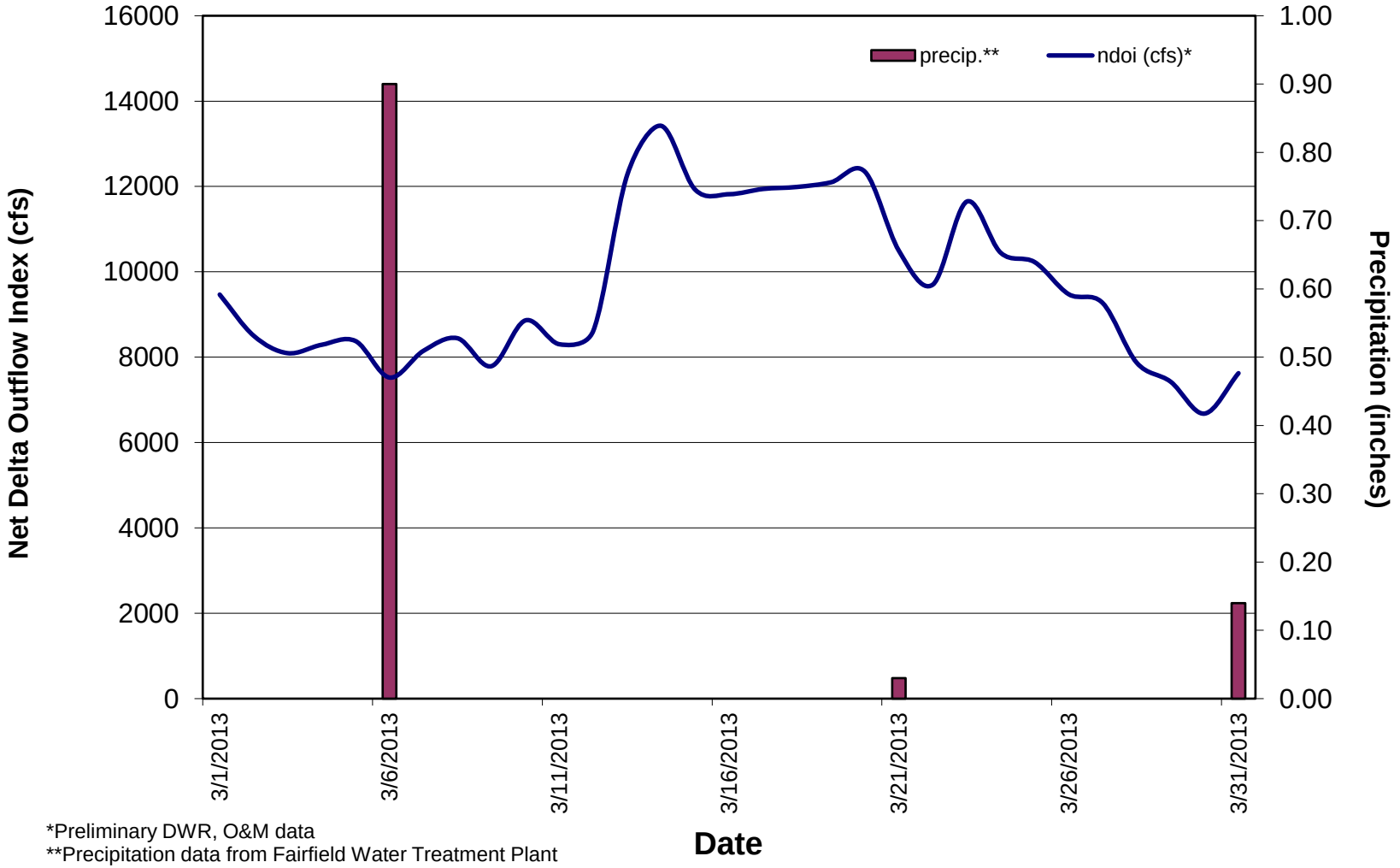
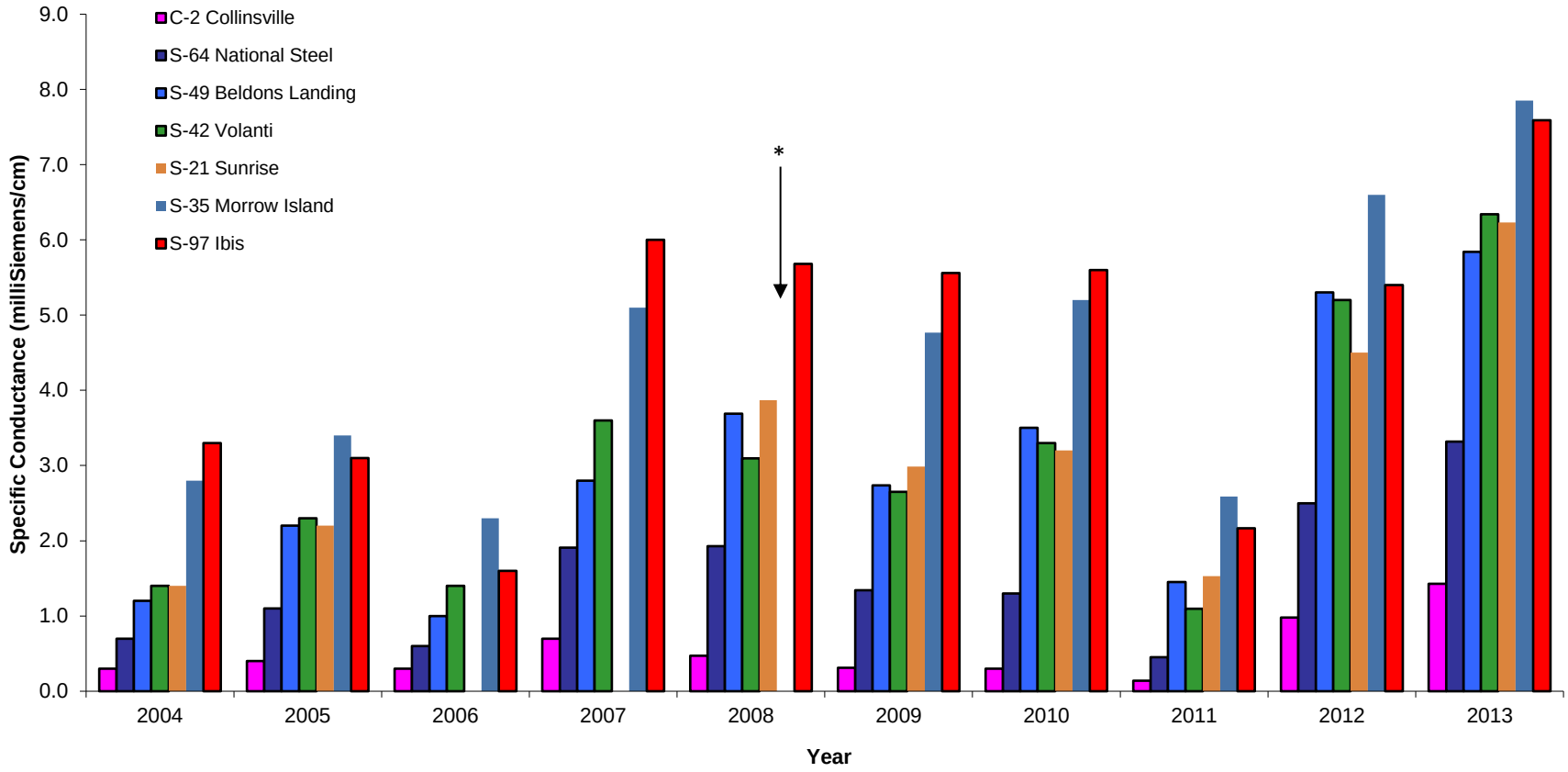


Figure 3: Daily Net Delta Outflow Index and Precipitation
March 2013



*Preliminary DWR, O&M data
**Precipitation data from Fairfield Water Treatment Plant

Figure 4. Monthly Mean Specific Conductance at High Tide: Comparison of Monthly Values for Selected Stations March of 2004-2013****



****2006 and 2007 data not available for S21 due to flooded roadways.
*Data not available for S35 due to equipment upgrade down time.

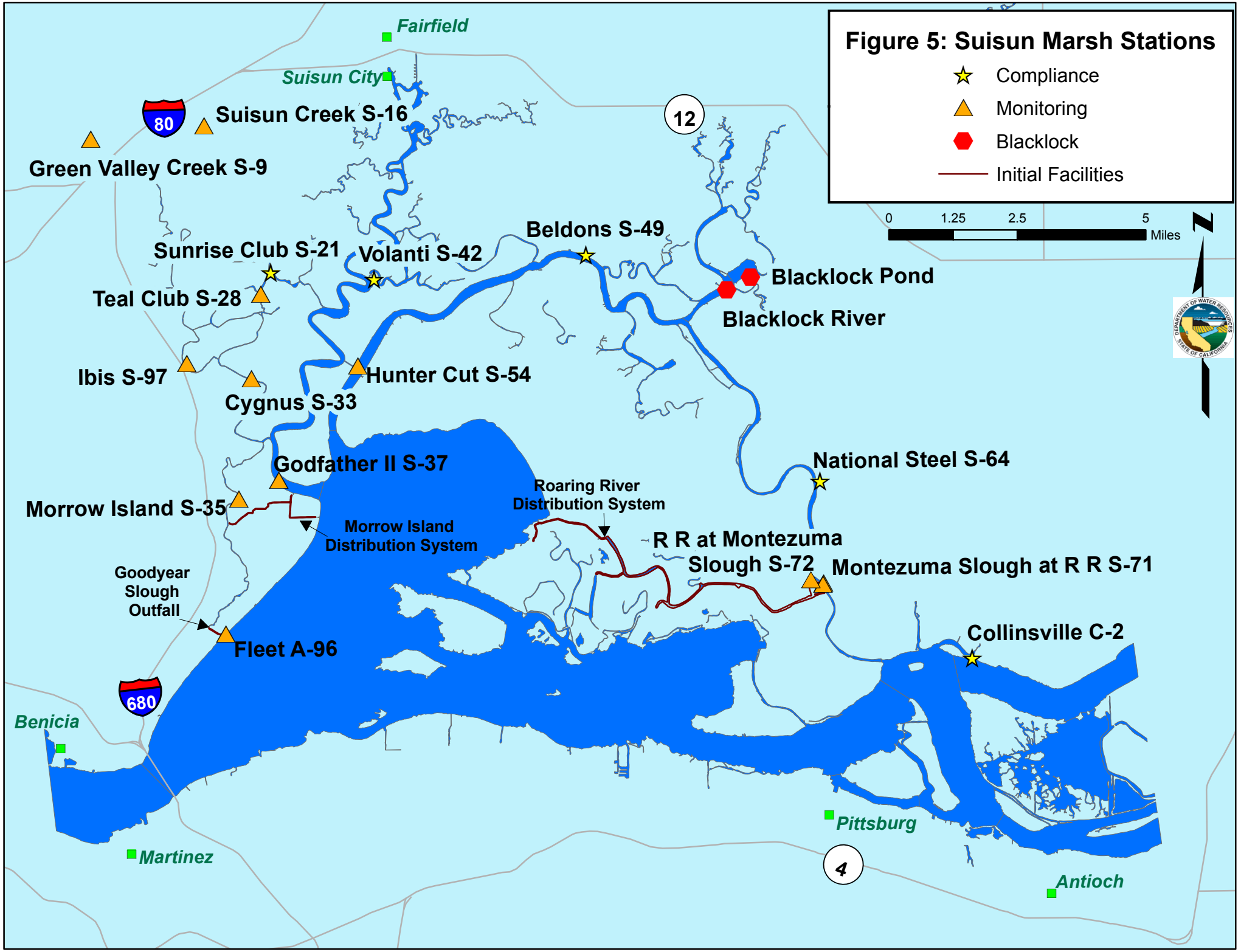


Figure 5: Suisun Marsh Stations
Compliance
Monitoring
Blacklock
Initial Facilities
0
1.25
2.5
5
Miles
Fairfield
Suisun City
Suisun Creek S-16
Green Valley Creek S-9
Sunrise Club S-21
Volanti S-42
Beldons S-49
Blacklock Pond
Blacklock River
Teal Club S-28
Ibis S-97
Hunter Cut S-54
Cygnus S-33
Godfather II S-37
National Steel S-64
Roaring River
Distribution System
Morrow Island S-35
Morrow Island
Distribution System
R R at Montezuma
Slough S-72
Montezuma Slough at R R S-71
Goodyear
Slough
Outfall
Fleet A-96
Collinsville C-2
Benicia
Pittsburg
Martinez
Antioch
80
12
680
4